

curvature and 1·5 inch diameter, the following results were obtained with 8,040 cells:—

Pressure.	Fraction of an atmosphere.	Length of spark.	Ratio to length at 1 atmosphere.	Ratio of length of spark to dilatation.
Millims.		Inch.		
760	$\frac{1}{1}$	0·079	1·00	$\frac{1}{1} = 1·000$
602	$\frac{1}{1·262}$	0·100	1·26	$\frac{1·26}{1·262} = 0·999$
414·7	$\frac{1}{1·833}$	0·200	2·52	$\frac{2·52}{1·833} = 1·375$
299·5	$\frac{1}{2·537}$	0·400	5·04	$\frac{5·04}{2·537} = 1·986$
141·5	$\frac{1}{5·370}$	0·800	10·08	$\frac{10·08}{5·370} = 1·876$

### ERNEST QUETELET

THE death of M. Ernest Quetelet, "chef du service Astronomique" of the Observatory of Brussels, took place at Ixelles on the 6th instant, after a long and painful illness. His connection with the observatory dates from 1855, when he entered it as an assistant to his father, the late Lambert Adolphe Jacques Quetelet, who was then the director, and who died so recently as February, 1874. Ernest was born in Brussels August 7, 1825. At that time his father was busily occupied in pressing on the king and the municipality of Brussels the importance of establishing an observatory for meteorological purposes. After much discussion and many delays it was determined in 1826 to establish an astronomical observatory; Quetelet was directed to obtain instruments, to visit Paris and London, and on January 9, 1828, he received his official appointment, his title being "astronomer." The three principal astronomical instruments were set up in 1835, but the first four volumes of the *Annales* of the observatory coming down to 1845 contain only meteorological notes. The first volume (date 1834) opens with an "aperçu historique des observations de météorologie faites en Belgique jusqu'à ce jour," commencing with 1763, and shows how thoroughly the director entered into the importance of the work. The observatory in 1845 was the centre of meteorological observing stations, of which there were more than eighty.

Although Ernest, as he grew up, shared his father's interest in the various observations included under the head meteorological, and took terrestrial magnetism as a special subject for study, on joining the observatory in 1855 he was appointed to take the astronomical observations and the *Annales* record that the observations were made by him and the calculations of the reductions by M. L. Estourgies. From 1857 he has had in hand the revision of a catalogue of the variable stars, a large part of which has been published. Two years ago he issued the climatological elements of Brussels, in a series of eighteen tables, for the ten years ending 1873, and in the *Bulletin* of the Société Royale are many papers by him on magnetism.

Before entering the observatory he was in the Engineers for several years, after having passed through the École Militaire of Brussels. In 1848 he was engaged as a subaltern on the work of the fortifications of Antwerp. It was while still in the Engineers he communicated his first paper to the Academy, "Recherches sur les Médiannes" (October 9, 1859), which was printed in the *Mémoires Couronnés*. In 1856, shortly after joining the Observatory, he wrote a paper on the magnetism of the earth in North Germany and Holland, and in 1859, "On the Magnetic Declination at Brussels."

The Observatory has all through its existence had to struggle against difficulties; one of the latest recommendations of the Commission on it was to effect the following improvements:—

"To complete the magnetic system of the Observatory by the acquisition of self-registering instruments, to organise the International Meteorological Service, to obtain an equatorial of large dimensions with the accessories necessary to the spectroscopic investigation of the heavens, and to increase the number and improve the position of the observer."

During many years M. Quetelet has often been appointed referee to the printing of papers in the *Mémoires* of the Académie Royale, and has been himself a frequent contributor.

### GEOGRAPHICAL NOTES

IN the Geographical Section of the French Association some papers of interest were read. Dr. Carret read a curious paper on the Distribution of Antipodes, in which the author indulged in some rather fanciful theorising. Gen. Ricci spoke on the geodetic work carried on by the Italian Government, which is energetically completing the triangulation of Italy, connecting it with the rest of Europe on the one side and Africa on the other. Gen. Ricci also spoke of the regular tidal observations carried on at various stations on the coast of Italy, mainly with a view of getting a true level for geodetic purposes. M. H. Duveyrier read an elaborate paper on the remaining problems in African geography, in which he divided unknown Africa into seven great regions: (1) The Sahara and the Libyan Desert; (2) The country between the Joliba and the Guinea Coast; (3) The upper courses of the Binue and Shari; (4) The region behind Cape Guardafui; (5) The equatorial chain of lofty mountains; (6) The completion of the basins of the Nile, Congo, and Ogove; (7) The basin of the Cunene. Altogether more than 11,000,000 square kilometres remain unexplored, more than one-third of the whole surface of Africa. At the mean rate of discovery since the beginning of the century, this might be covered in about forty-eight years, though the ratio is now so increased that it ought to be done in much less time. A paper by M. Maunoir recounted the services done to geography by France since 1800, and when all put together with the eloquence of a Frenchman, they seem formidable.

NEWS from Capt. Tyson's Arctic expedition in the *Florence* has been brought to Washington by the schooner *Helen*, which wintered in the same bay on the coast of Cumberland. Meteorological observations were taken most accurately during winter by Mr. Sherman, the physicist of the expedition. Unfortunately the naturalist inflicted on himself a wound when on duty, and was disabled for the greater part of the winter. Capt. Tyson went to Disco to recruit natives, collect goods, and purchase dogs. He fulfilled his duty with his wonted activity and success. But when everything was ready he learned by a message sent from Washington that the preparations were useless, the American Congress having taken its vacation without deliberating upon the report so carefully drawn by the Marine Committee. The brave and accomplished commander of the *Florence* is now on his way to Washington, where he is expected daily. We are informed that a demonstration will be made against this piece of Parliamentary negligence. This preliminary expedition was entirely fitted out at the expense of Capt. Howgate and his friends.

NEWS has arrived that the Bremen steamer *Neptune*, Capt. Rasmussen, which left for the Ob, in Siberia, on July 16, reached Hammerfest on the 6th instant with a full cargo of Siberian wheat. The *Neptune* was laden with all sorts of mercantile goods. She entered the Nadym on August 13, and had no ice difficulties on the voyage out. Perhaps in future, when the

navigation of the estuary of the Ob is better known, the voyage may be made in even a shorter time. Indeed if depôts were established at suitable points on the north Norwegian coast, it might be possible for a ship to make two journeys to Siberia in one summer. Probably the Ob is the most important of the Siberian rivers so far as commerce is concerned. Trade on the Ob is already considerably developed, the river being navigated by over thirty steamers. The region around the river is the most productive and most thickly inhabited in Siberia.

In an article in the September number of Petermann's *Mittheilungen*, on the chief branches of the Russians, much interesting information is given on the characteristics and distribution of the Great, Little, and White Russians, illustrated by a carefully constructed map. In the same number Dr. Junker, in a letter to Dr. G. Schweinfurth, describes his travels in the south-west part of the Nile Region in January-October, 1877, adding considerably to our knowledge of the region, and making several corrections on existing maps. Lieut. Weyprecht describes the results of his observations in 1871-4, on the temperature and depth of the sea to the east of Spitzbergen. The sea, he finds, is comparatively shallow, seldom exceeding 400 metres.

WE have received a handsome atlas of the State of New Hampshire (U.S.), containing, besides a series of beautifully-executed maps of the state and of its counties,—meteorological, geological, agricultural, and arboricultural,—a vast amount of well-arranged information on its topography, geography, river systems, climatology, railroads, educational institutions, agricultural and botanical productions, mechanical and manufacturing interests, &c. The work is edited by Mr. H. F. Walling, C.E., and Prof. C. H. Hitchcock, and is published by Comstock and Clive, New York. The work is creditable both to the editors and publishers. The long list of "patrons" of the atlas appended—mostly people in business—speaks well for the intelligence of the inhabitants of New Hampshire.

In a letter to Sir Samuel Baker from a gentleman in the Khedive's service, the latter describes a successful journey which had been made with some Indian elephants in the White Nile region, proving that this powerful and useful animal may be utilised advantageously in African travel and exploration.

#### OUR ASTRONOMICAL COLUMN

THE INTRA-MERCURIAL PLANET.—In addition to the letter addressed to the Astronomer-Royal by Prof. James Watson, after revising his first position of the object near  $\theta$  Cancri, more carefully at Ann Arbor, similar communications have been made to M. Fizeau (*Comptes Rendus*, May 2), Prof. Förster (*Circular zum Berliner Astronomischen Jahrbuch*, No. 98), and to Prof. Peters (*Astronomische Nachrichten*, No. 2,217). The definite position is in R.A. 8h. 27m. 24s., Decl.  $+18^{\circ} 16'$  for July 29, at 5h. 16m. 37s. Washington M.T., or 10h. 24m. 49s. M.T. at Greenwich, which position Prof. Watson considers to be trustworthy within five minutes of arc, with a greater probable error in the declination than in the right ascension. The other points named by the discoverer, upon which stress is to be laid, are the fact of the star  $\theta$  Cancri being also observed, the appearance of a sensible disk with a power of 45 on a  $4\frac{1}{2}$ -inch refractor, its ruddy colour and much greater brightness than that of the neighbouring star. There has never been a suspicion of a variable star in this vicinity, nor can the appearance of a disc be so explained. Prof. Watson seems to have satisfied himself that the object was not a comet; indeed, such a body would hardly appear round and well-defined with the sun totally eclipsed. In the case of the comet of March 1847, which was observed in full daylight, at a

similar distance from the sun to that of Prof. Watson's object, two short tails were visible though the head was circular, and the great comet of February, 1843, also exhibited a bifid tail, which was bright and distinct to the naked eye. Mr. Hartnup, who observed the comet of Klinkerfues, 1853, in broad daylight, described it as circular, well-defined, and without tail, but the case is hardly analogous to that of a comet viewed while the sun is wholly hidden.

[Since the above was in type, the full details of Prof. Watson's observations and reductions have been received.]

THE VARIABLE NEBULA IN TAURUS (HIND, 1852).—In the diagram attached to M. Tempel's remarks upon this object in *Astron. Nach.*, No. 2,212, a distinction is made between the position given in No. 839 of the same periodical and that assigned with reference to the neighbouring variable star T Tauri. To prevent misconception on this point it may be well to remark that, on the first night the nebula was perceived with Mr. Bishop's seven-inch equatorial—October 11, 1852—it preceded the variable star 1s.2, and was south of it  $0^{\circ} 7'$ , as stated in the *Astron. Nach.*, and that at no subsequent time when the nebula was observed with the same instrument was any difference of position noticed: it appeared to nearly touch the star on the S.P. side. No. 1 on M. Tempel's diagram should be therefore erased. In a note in his Supplementary Catalogue Mr. Dreyer states that he found no appearance of nebulosity near the well-known variable; nor did Dr. Copeland, observing with the large refractor at Lord Lindsay's Observatory; nor M. Tempel, with a fine Amici of 11-in. aperture, at Arcetri. On the other hand, M. Otto Struve still found traces of nebulosity with the Pulkova instrument, which he "believes is certainly the variable nebula itself, only in altered brightness and spread over a larger space;" and he adds, "some traces of nebulosity are still to be seen exactly on the spot where Hind and d'Arrest placed the variable nebula." The accurate position of T Tauri has yet to be determined by meridional observation. Argelander re-observed Bessel's star of the ninth magnitude, which precedes it  $16^{\circ} 55'$ , about  $4'$  south.

THE LATE DR. E. VON ASTEN.—By the early death of Dr. von Asten astronomy has lost a most able worker in a branch which has numbered of late years fewer distinguished names than formerly. He was one of Argelander's pupils and intended to apply himself to observations, but, we believe, through a serious accident, he was incapacitated for active occupation, and his desire to devote his attention to astronomy could only be gratified by obtaining employment in calculation. This he was so fortunate as to effect through the director of the Imperial Observatory at Pulkova, M. Otto Struve, who engaged him as one of the staff of computers. In this position Dr. von Asten had for some time carried on a rigorous investigation on the motions of Encke's comet, one of the most interesting results of which has been to prove that while in some revolutions an acceleration similar to that attributed by Encke to the existence of a resisting medium has made itself evident; in others the motion of the comet could be precisely followed without such hypothesis, and hence a different cause might be found for the cases of acceleration. Dr. von Asten previous to his connection with Pulkova, minutely discussed the whole of the observations of the great comet of Donati (1858 vi.), arriving at the conclusion that at the time it was visible it was moving in an elliptical orbit with a period of nearly 1,900 years.

#### NOTES

THE Association of German Naturalists and Physicians commenced its sittings at Cassel on Wednesday last week, and judging from the numbers of the *Tageblatt* and of the Cassel papers that have been sent us, the meeting has been quite as